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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,138	10/10/2001	Neal M. Muylaert	BOEI-1-1006	8881

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EXAMINER	
COMPTON, ERIC B	
ART UNIT	PAPER NUMBER
3726	

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Acti n Summary	Application No.	Applicant(s)	
	09/975,138	MUYLAERT, NEAL M.	
	Examiner	Art Unit	
	Eric B. Compton	3726	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 29 (Fig. 1); and 43 (Fig. 2). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 30b (page 3, line 30); 42b (page 3, line 32, page 4, lines 19, 26, and 30); 67 (page 4, line 3). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Color photographs and color drawings are acceptable only for examination purposes unless a petition filed under 37 CFR 1.84(a)(2) is granted permitting their use as acceptable drawings. In the event that applicant wishes to use the drawings currently on file as acceptable drawings, a petition must be filed for acceptance of the color photographs or color drawings as acceptable drawings. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and an amendment to the first

paragraph of the brief description of the drawings section of the specification which states:

> The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the U.S. Patent and Trademark Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings have been satisfied.

4. The drawings are objected to under 37 CFR 1.83(a) because they have lost clarity due to being apparently photocopied. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (f) he did not himself invent the subject matter sought to be patented.

6. Claims 1-20 are provisionally rejected under 35 U.S.C. 102(f) because it appears that the applicant did not solely invent the claimed subject matter.

Applicant discloses, "This application incorporates by reference co-pending application titled "Opposing Conical Elastomeric Bearing Assembly," ***invented by Rob rt T. Loftus***, attorney docket number BOEI-1-1005." Specification, Page 1, lines

16-19 (emphasis added). The above co-pending application has been published Patent Application Publication US 2003/0068104 (cited in PTO Form 982 attached). The Examiner has reviewed the above publication, which is directed to the same essential subject matter claimed, i.e., a bearing assembly. *See* US 2003/0068104, Figures 4-6.

The method of forming the bearing is implicit for the disclosure of Loftus. *See* MPEP § 2144.01. "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). Based on above evidence, it appears that the two inventors were joint inventors of the present invention. However, Applicant filed this patent application, as the sole named inventor.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

8. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view either of U.S. Patent 3,986,126 to Katzer, U.S. Patent 4,772,151 to Lammers et al ("Lammers"), or U.S. Patent 5,286,132 to Morini.

Applicant discloses, "This application incorporates by reference co-pending application titled "Opposing Conical Elastomeric Bearing Assembly," invented by Robert T. Loftus, attorney docket number BOEI-1-1005." Specification, Page 1, lines 16-19. The above co-pending application has been published Patent Application Publication US 2003/0068104 to Loftus (cited in PTO Form 982 attached). Thus, this co-pending reference is considered to be apart to the present application. *See* MPEP § 2163.07.

US 2003/0068104 discloses, as prior art:

> Elastomeric conical bearings are commonly used in bearing assemblies for helicopter rotor systems to accommodate rotor motion. The bearing assemblies are axially preloaded to prevent the conical bearing elements from experiencing a resultant tensional load. Currently, mono-directional bearing elements are employed at each attachment site of the main rotor hub. ***FIG. 1 depicts a view of a prior art articulated hub assembly 20a***. The hub assembly 20a includes a tire bar 26 connected to a hub center body 22. The tie bar 26 is connected to the center body 22 in a similar manner as disclosed in FIG. 1, however, the bearing assembly 30a is substantially different. The bearing assembly 30 includes a pair of conical bearing elements 52 contacting the journal 28 on the bearing's inner surface 52 and the outer bearing surface is contained within an outer housing 42a. Each bearing element is a mono-directional single conical taper bearing having an elastomeric element 54 contained within. The conical bearings are arranged such that the apex of the conical elements extends radially outward from one another. The bearing arrangement yields a force couple that extends from one bearing to the other. The force couple yields a bearing pre-load path 43 extending through the hub center body 22.

Section [0004] (emphasis added). When applicant states that something is prior art, it is taken as being available as prior art against the claims. Admitted prior art can be used in obviousness rejections. *In re Nomiya*, 509 F.2d 566, 184 USPQ 607, 610 (CCPA 1975) (Figures in the application labeled "prior art" held to be an admission that what was pictured was prior art relative to applicant's invention.).

AAPA discloses generally a conical bearing assembly including an outer housing (50) configured with a plurality of mounting flanges for attachment to the hub center body (22); and a conical elastomeric bearing element (54) having an inner race (52), configured to receive the tie bar journal section (28a) of the rotor assembly. *See* US 2003/0068104, Figure 1. The steps of forming the bearing are inherently required.

However, AAPA does not disclose providing a preloaded opposing conical bearing assembly in the rotary hub assembly.

Katzer discloses a method of forming a preloaded opposing conical bearing assembly having a preloaded opposing conical bearing assembly, having the same general structural configuration as Applicant's bearing assembly. *Compare* Figure 1 or Katzer with Figure 3 of Applicant. "[A]fter assembly and mounting of the pivot joint the tightened forces of the assembled joint will totally bear upon the rubber sleeves and will not be transferred in any part to the outer surfaces of the trunion bearings 14 and 15 [of the vehicle frame]. Cols. 3-4, lines 50-2. This is nearly identical to the motivation for Applicant to use a preloaded opposing conical bearing assembly, i.e., to eliminate of preload forces on hub body. *See* Specification, page 2, lines 13-14 & 32-33.

Lammers discloses a method of forming a preloaded opposing conical bearing assembly having a preloaded opposing conical bearing assembly, having the same general structural configuration as Applicant's bearing assembly. *Compare* Figure 1 or Lammers with Figure 3 of Applicant. "The dual tapered, elastomeric preloaded bearings restrain and capture the relatively moveable member axially and radially without a thrust bearing." Abstract. "The elastomeric bearings 18 and 20 also serve as isolation barriers

between the frame 14 and the shaft 12 to reduce transfer or amplification of noise and vibration between these two members. Col. 3, lines 49-53.

Morini discloses a method of forming a preloaded opposing conical bearing assembly having a preloaded opposing conical bearing assembly, having the same general structural configuration as Applicant's bearing assembly. *Compare* Figure 1 or Morini with Figure 3 of Applicant. Morini disclose " a "object to the invention is to provide biconical swivels which, in addition to a high hunting strength, having a high radial stiffness together with a uniform distribution of stress on the elastomeric material so as to prevent the most stress elastomeric area from giving rise to premature yield due to fatigue." Col. 2, lines 30-36. "In particular, joint 1 can absorb axial stresses, radial stresses and torsion stresses about axis "X" ..." Col. 4, lines 52-53.

Regarding claims 1, 6, and 10, it would have been obvious to one having ordinary skill in the art at the time of invention to have formed the fully articulated rotary hub assembly for rotary aircraft having preloaded opposing conical bearing assemblies, in light of the teachings of either Katzer, Lammers, or Morini, in order to reduce preload stress on the frame, minimize the oscillations and noise, and provide uniform distribution of stress on the bearing.

Regarding claim 11, AAPA discloses that it is known that the bearing assemblies are in a preloaded condition. *See* US 2003/0068104, Figure 1.

Regarding claims 4, 8, and 12, AAPA discloses that the bearing assemblies are in a preloaded condition, but do not disclose the axial pre-loading range between 8,500 and 15,000 lbs. "[W]here the general conditions of a claim are disclosed in the prior art,

it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 2, 7, and 13-14, Lammers discloses that the bearing is bonding to the inner and outer races. Col. 2, lines 63-65. Katzer discloses the elastomeric is vulcanized to the housing clearly suggesting adhesive bonding. Col. 2, lines 40-43.

Regarding claims 3 and 15, Katzer suggests bonding the bearing assembly to the inner race by frictional fitting. Col. 2, lines 47-50 ("The outer ends of the rubber sleeves 8 and 9 have the thicker walls and provided with an annular bulge or bead 12 and 132 to function as a support or contact surface.").

Regarding claims 5, 9, 16, and 18, AAPA discloses these particulars regarding the use of a bearing assembly with a rotary assembly.

Regarding claims 17 and 19-20, Lammers shows connecting the bearing elements to each other by placing a plurality of bearing fastener elements, e.g., bolts (60) extending through the end plates (32) of each inner race. Katzer shows connecting the bearing element to each other with a bolt (22) as well.

Prior Art Referenc s

The prior art references listed on the enclosed PTO-892, but not used in a rejection of the claims, are cited for their teachings of forming bearing assemblies.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (703) 305-0240. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter B. Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

Eric Compton
Patent Examiner
A/U 3726

November 7, 2003